

APPENDIX S

RESPONSE TO PUBLIC COMMENT

Prepared by the New Hampshire Department of Environmental Services

9/10/2010

On June 14th 2010, the New Hampshire Department of Environmental Services (DES) requested comments on the Draft New Hampshire Statewide Total Maximum Daily Load (TMDL) for Bacteria Impaired Waters report. The public comment period ended on July 23, 2010. The following represents the Department's response to public comments received during this period. Comments are numbered with the Department's response immediately following in bold font.

A. Comments from Richard Flanders, Vice Chair, Baker River Watershed Association

A.1 COMMENT:

Our comments are focused on the finding that four sections or "waterbodies" of the Baker River in Wentworth, Rumney and Plymouth are considered "impaired" due to *Escherichia coli* in excess of state standards for Class B waters.

While the BRWA appreciates the support it gets from the Department of Environmental Services for its water sampling efforts and reporting, and in the past for subsidizing water testing costs at the state laboratory in Concord, we remind the state that we are not driven to sample to meet state and federal reporting requirements. We understand the need under the Clean Water Act to report every two years on the status of the state's waters under the 305(b) requirement, and the 303(d) reporting of "impaired" waters. However we disagree on how the listing process is done as part of the state's *Consolidated Assessment and Listing Methodology*. Since the state does an inadequate job of assessing the state's rivers and relies on volunteer groups, the unfortunate result is that for some waterbodies, the only data being used for the federal reporting is that collected by volunteer groups such as the BRWA. In a way, it penalizes such groups for collecting the very data the state is mandated to collect! Without our data there would be nothing current for DES to use and thus the listing of impaired waterbodies would be much shorter!

A.1 DES RESPONSE: (NO CHANGES MADE)

DES agrees that the collection of water quality data by watershed and volunteer monitoring groups that meets the State's quality assurance criteria for making assessments, greatly improves DES' ability to assess and report on the status of the New Hampshire surface waters to the federal government. DES understands that some volunteer groups may collect data for reasons other than state or federal reporting requirements and tries to help volunteers achieve their objectives. That

being said, federal regulations require DES to consider all available data (regardless of why it was collected) when preparing the 303(d) list of impaired waters [40 CFR 130.7(b)(5)]. This includes data collected by volunteers.

Good data is essential for good water management. Without it, we would not know where or how to best devote limited resources to manage water quality. In DES' view, all monitoring groups should be proud that their data is used in assessments as it is therefore considered of high quality and is being used to help protect and restore the State's valuable water resources. Due to resource constraints, it is true that the State has relied significantly on the excellent work of volunteer groups (and others) to supplement its data collection efforts. Recognizing that the State has limited staff and resources for monitoring, one of the goals of the New Hampshire Monitoring Strategy¹ is to explore ways to expand and better integrate volunteer monitoring to collect data for assessment purposes as well as the monitoring objectives of the volunteers. Since 2008, we are pleased to report that approximately 45% of our assessment data has come from volunteers, which we greatly appreciate. Without this supplemental data, the list of impaired waters (as well as the list of waters that meet water quality standards) would likely be smaller.

In cases where the data indicates impairment, having the water body listed on the 303(d) List of impaired waters is often necessary before one can apply for funds to develop and/or implement watershed restoration plans. Consequently, in DES' opinion, collection of data by any group that indicates impairment and the subsequent listing of the water body on the 303(d) list, should not be viewed as a penalty but rather as an important contribution towards the initial steps of restoring the water body to better health. With this in mind, we greatly appreciate the data provided by the Baker River Watershed Association (BRWA) and look forward to working with the BRWA to help bring the Baker River into compliance with State water quality standards for bacteria.

The DES Consolidated Assessment and Listing Methodology (CALM - see <http://des.nh.gov/organization/divisions/water/wmb/swqa/documents/2010calm.pdf>) includes details of how New Hampshire surface water assessments are conducted. The CALM is issued for public comment every two years. The next opportunity will be announced on the DES website in the late summer or early fall of 2011 (most likely under <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>). Anyone with comments on how DES conducts surface water assessments, is encouraged to submit their comments at that time.

A.2 COMMENT:

Secondly, it seems unfair that the entire TMDL process for bacteria relies on the highest reported single sample. This occasionally results in a single sample impairment listing but not for the geometric mean for that location. Or, as in the case of the Wentworth

¹ State of New Hampshire Water Monitoring Strategy. New Hampshire Department of Environmental Services. September, 2005. Document No. R-WD-05-27. See <http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-05-27.pdf>.

sample location noted on page 87, the single sample meets standards but the geometric mean does not! This is an artifact of the state standards. When the standards were established by the Legislature, there was never an intent that their adoption would result in some federal listing for impairment. Given that states have adopted different numerical standards for bacteria, how can we say that Vermont waters are any more or less safe for swimming than New Hampshire's? The adoption of the E. coli standard in NH was with the understanding it would be used as an indicator of potential human contamination, and not as a de facto standard for legal action. How do you defend a standard of 406 E. coli per 100 ml as safe to swim versus 410 as not? It is an artifact that we use the instantaneous 406 number versus say 1000 in another state. This is true with the use of 126 E. coli per 100 ml for the geometric mean. To list water as "impaired" for a single event is to not understand the basis for the standard.

A.2 DES RESPONSE: (NO CHANGES MADE)

TMDLs must comply with State water quality standards. DES surface water quality criteria for bacteria for primary contact recreation include both a geometric mean (based on at least three independent samples collected within 60 days) and a single sample maximum for situations where there isn't enough data to calculate the geometric mean. Consequently, the TMDL must comply with both criterion.

New Hampshire's bacteria criteria for primary contact recreation are based on EPA's 1986 Ambient Water Quality Criteria for Bacteria² which provides relationships between bacteria concentrations and the risk of contracting gastrointestinal illnesses via ingestion of the surface water. As discussed in EPA's 1986 document, the single sample maximum criterion (SSMC) is statistically related to the geometric mean and accounts for variability. For example, the geometric mean for fresh surface water is 126 E.coli/100ml and the single sample criterion is 406 E. coli/100 ml. Based on statistics, this can be interpreted to mean that if there is a single sample equal to 406 E.coli/100ml, one can be 90 percent confident that the geometric mean of 126/100 ml would be exceeded.

Finally, according to the CALM (see A.1 DES Response), at least two violations are needed before a water is listed as impaired. This criteria was added to the CALM because DES recognizes that calling a water body impaired based on only one violation is often perceived as questionable, no matter how good the data may be. This holds true for listing waters for primary contact impairment based on bacteria. At least two violations of the single sample criterion and/or at least one violation of the geometric mean (which is based on at least three samples), are needed before the water body is listed as impaired. If there are at least two samples that exceed the single sample criterion, there is a high probability (greater than 90 percent) that the water body would exceed the geometric mean criterion. Consequently, DES believes

² Ambient Water Quality Criteria for Bacteria – 1986. United States Environmental Protection Agency. EPA/440/5-84-002. January 1986. A copy of this document can be downloaded from <http://www.epa.gov/waterscience/beaches/files/1986crit.pdf>.

that listings based on comparisons to single sample criteria as described in the CALM, are reasonable.

A.3 COMMENT:

Thirdly, to use the single sample or geometric mean result as the basis for a percent reduction for a bacterial TMDL is nonsensical. Looking again at the four Baker river listings on page 87 for the second impaired water in Wentworth, we must either meet a 69% single sample reduction or a 15% geometric mean reduction? This is due to one data point (or pairs for the geometric mean) versus 10+ years of data for that station? What if the data were 5+ years old and all subsequent data showed no problem? On page 29 it states: "Once a waterbody is listed as impaired, and assuming there is no new data indicating attainment of water quality standards, it remains impaired in future cycles regardless of how old the data used to make the original impairment decision has become." We question why more recent data has not been used in this Draft report (Appendix D states the data used was from 2002 to 2007)?

A.3 DES RESPONSE: (NO CHANGES MADE)

As stated in section 8.2 of the report, the reductions are provided to give a "rough" estimate of the reductions needed. They are not intended to be interpreted as absolute values but more as order of magnitude estimates that watershed managers can use as a guide. DES recognizes the high variability of bacteria concentrations in surface waters and that these estimates are sometimes based on limited data. Nevertheless, DES thought it would be helpful to provide at least some idea of reductions needed rather than no indication at all.

According to the CALM (see A.1 DES Response), the most recent year of data is used to make assessments if it meets the criteria in the Use Support Matrix for Bacteria -Primary Contact Recreation. Waters may be considered for removal from the 303(d) list of impaired waters (i.e., delisted) if at least two of the samples showing no impairment are collected at the same or more water quality limited sites and under similar conditions (i.e., wet weather, dry weather, season, etc.) as when the older exceedances occurred. When this bacteria TMDL was originally prepared, it was based on the 2008 303(d) list of impaired waters since the 2010 303(d) list had not been finalized. The 2008 303(d) list is based on data up to, and including 2007 and shows four assessment units (AUs) on the Baker River as being impaired for bacteria. These AUs are shown in Table 1-2 of the Statewide Bacteria TMDL. DES has since prepared and submitted its final 2010 303(d) List to EPA for approval. The 2010 assessment includes more recent data (up to and including 2009). Based on a review of the data in accordance with the CALM, the four AUs on the Baker River are still listed as impaired for bacteria on the 2010 303(d) List. Specifics for each listing decision may be obtained from Ken Edwardson, the DES Surface Water Assessment Coordinator at Ken.Edwardson@des.nh.gov.

A.4 COMMENT:

Lastly, we question the basic context of “allocating” bacteria when they do not come from a point source. We cannot control a parent who allows their baby to “swim” in the Baker River in fowled diapers any more than we will be able to convince their pet dog from relieving himself. The data the BRWA collects is merely a snapshot of river conditions we happen to grab in a 200 ml bottle at the time of sampling. Is it representative of general conditions the prior four weeks since the last sample taken at that location? While we essentially pretend it is, the reality is that ambient bacterial levels ramp up and down depending on sources, river flows, and a myriad of other variables. We do not feel that the data in itself is cause for action, and in fact we recommend to local health officers that if a result appears high, the first thing is to take a subsequent sample. Isn’t that the basic tenet of the DES Beach Inspection Program?

A.4 DES RESPONSE: (NO CHANGES MADE)

With regards to allocations and compliance, Section 5.2 of the report states the following: “The underlying assumption in setting a concentration-based TMDL for bacteria is that if all sources are less than or equal to the WQS, then the concentration of bacteria within the receiving water will attain WQS. This methodology implies a goal of meeting bacteria standards at the point of discharge for all sources. Although end of pipe bacteria measurements can identify and help prioritize sources that require attention, compliance with this TMDL will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). Consequently, for the example given in the comment above, compliance will not be based on sampling of the baby’s diaper but by sampling of the surface water the baby is recreating in.

DES understands that it will be challenging to control bacteria sources, especially nonpoint sources such as bacteria from a baby’s diaper or pet waste. However, with increasing human population, we all need to keep working diligently on abating such pollution through education, outreach, adoption of municipal ordinances and construction of structural treatment measures if ambient bacteria standards are to be met. As stated in Section 7 of the report, federal grant money is available to help communities off-set some of the costs associated with identifying and reducing and/or eliminating nonpoint source pollution. DES staff in the Watershed Assistance Program are available to assist communities by providing information and assistance with filing applications for the federal Clean Water Act 319 Grant funds which can be used for qualifying nonpoint source load reductions to impaired waterbodies. For more information about the 319 grant funds visit the Watershed Assistance Program website at:

<http://des.nh.gov/organization/divisions/water/wmb/was/categories/grants.htm>

As previously mentioned (see A.1 DES Response above) federal regulations require DES to use all available data when preparing the 303(d) list of impaired waters. With regards to variability, DES understands that ambient bacteria concentrations can vary significantly with time and that samples represent a snapshot of water

quality. New Hampshire's bacteria standards for primary contact recreation recognize the variability of bacteria by specifying geometric mean criteria based on at least three samples collected over 60 days and single sample maximum criteria that are statistically related to the geometric mean (see A.2 DES Response above). Further, New Hampshire's water quality standards for bacteria (RSA 485-A:8 and Env-Wq 1700) apply at all times. Therefore, before a water body can be taken off the impaired list for bacteria, sufficient data has to be collected in accordance with the CALM (see A.1 DES Response) that indicates compliance with bacteria standards at all times.

With regards to additional sampling, DES encourages anyone who suspects conditions in an impaired water body is now meeting water quality standards, to conduct additional sampling. Prior to sampling, DES should be consulted to ensure the sampling plan will provide sufficient information to delist the waterbody (provided the samples do not show a violation). With regards to the DES Beach Program, it is true this program follows a protocol that includes subsequent sampling when results indicate a potential violation (see http://des.nh.gov/organization/divisions/water/wmb/beaches/faq_advisories.htm). When a single sample result is over the standard by 70 counts or if there are two that exceed the single sample criterion, an advisory is immediately posted at the beach and the beach is re-sampled. Once sampling indicates compliance with bacteria criteria, the beach advisory is removed. It should be recognized, however, that for 303(d) listing purposes, data for designated beaches are assessed the same as for surface waters that are not designated beaches with regards to the number of samples that must meet or exceed the geometric mean or single sample criteria. Consequently, if a beach was closed for only one week during the swimming season due to high bacteria, but open the rest of the season, it may still be assessed as impaired and placed on the 303(d) list based on the protocols in the CALM.

B. Comments from Michael J. Redding, P.E., CPESC, Senior Engineer GeoInsight, Inc., and Member, Lower Merrimack River and Souhegan River Local Advisory Committees

B.1 COMMENT:

For both the Lower Merrimack River and Souhegan River there are several sections that are used for swimming. The LACs have observed significant uses of the Rivers by adults and children for swimming. As a water quality monitor for the Souhegan River I can attest to swimming activity. Would the NHDES consider lowering the TMDL for segments of the Merrimack and Souhegan Rivers to meet the TMDL standard for a designated beach?

B.1 DES RESPONSE: - (NO CHANGES MADE)

The TMDL for any water body is based on the water quality standards that apply to that waterbody at the time the TMDL is conducted. The bacteria impaired segments (i.e., assessment units) on the Souhegan and Merrimack rivers are not currently listed as “designated beaches”; consequently the more stringent bacteria standards for designated beaches were not used to develop the TMDL for these assessment units.

According to the DES Consolidated Assessment and Listing Methodology (CALM) (see A.1 DES Response), a “designated beach is an area on a waterbody that is operated for bathing, swimming, or other primary water contact by any municipality, governmental subdivision, public or private corporation, partnership, association, or educational institution, open to the public, members, guests, or students whether on a fee or free basis”. The Lower Merrimack River and Souhegan River LAC’s can request areas to be assigned as designated beaches by contacting the DES Beach Program Coordinator at: <http://des.nh.gov/organization/divisions/water/wmb/beaches/categories/contactus.htm>. Once an area meets the definition of a Public Designated Beach the beach owner or operator must apply for admission into the program. Approval of Designated Public Beaches require the owner and operator to be responsible for adhering to applicable state beach Statutory Authority and the defining Public Bathing Places Rules defined in Enc-Wq 1100.

When an area is assigned the status of Designated Beach, it applies to a distinct swimming area location and not to the entire assessment unit. In such cases the original assessment unit is then split in two, with a new assessment unit number assigned to the designated beach, and a different number assigned to the remainder of the original assessment unit. The more stringent bacteria standards would only apply to the designated beach assessment unit.

Finally it should be noted that the default bacteria standards for surface waters that aren’t designated beaches are still considered protective of primary contact recreation uses such as swimming and are consistent with bacteria standards recommended by the U.S. Environmental Protection Agency (EPA) (see <http://water.epa.gov/lawsregs/lawguidance/beachrules/bacteria-rule-questions.cfm#changes> and <http://www.epa.gov/waterscience/beaches/files/1986crit.pdf>).

B.2 COMMENT:

As the Water Quality Standards Advisory Committee develops recommendations for new standards, bacteria should be considered for inclusion in modeling requirements for new/redeveloping alteration of terrain projects.

B.2 DES RESPONSE: (NO CHANGES MADE)

DES agrees and will continue to seek public input and work on methodologies to help ensure that alteration of terrain projects will not contribute to or directly cause violations of surface water quality standards for any parameter (including bacteria).

B.3 COMMENT:

It would also be helpful to include a reference to the LACs and the chairperson's contact info for each River to recognize the importance of these groups and collaboration for restoration and implementation plans.

B.3 DES RESPONSE: (NO CHANGES MADE)

DES certainly values the important work performed by the LACs as well as other watershed groups and organizations, however acknowledgement of such appreciation and inclusion of the requested contact information (which will change in the future) in the TMDL is not consistent with the goals of the report or considered necessary to recognize the importance of such groups.

B.4 COMMENT:

I also feel that more guidance and direction should be given to the LACs on what and how they can contribute to achieving the reduction goal. At minimum I would think a 319 grant that provided each LAC with funding to embark on a multi-media campaign to create awareness would be a good first step. I feel NHDES needs to assign the LACs with a more defined responsibility resulting from the TMDL.

B.4 DES RESPONSE: (NO CHANGES MADE)

It should first be recognized that implementation plans are not a required element of TMDLs, however, because of their importance to the restoration process, information regarding implementation is often provided in TMDL reports. DES believes that the general implementation plan included in Section 6 is useful because of the commonality of the pathogen sources in many impaired segments (e.g., most surface waters in communities are impacted to some degree by pet waste) and the best management practices used to abate and control those sources. It is hoped that this guidance will help initiate the implementation process using a phased approach (starting with best management practices (BMPs) that are easiest to implement) to reduce ambient bacteria concentrations as rapidly as possible. After each phase, ambient monitoring should then be conducted to determine if the abatement measures were sufficient to meet ambient water quality standards or if additional reduction measures are necessary.

Development of specific best management practices that are explicitly geared towards achieving specific percent reductions in each of the 379 bacteria impaired assessment units is not required for approval of the TMDL, and would have delayed completion of the TMDL for years since the information and resources needed to develop such plans were not readily available. However, recognizing the value of site specific implementation plans and the desire of some stakeholders to conduct

such studies prior to initiating implementation activities, examples were provided in the TMDL for stakeholders to use as templates (see Appendices Q - Furnace Brook Watershed-Based Restoration Plan and Appendix R - Greenville Illicit Discharge Detection and Elimination (IDDE) Investigation). The Furnace Brook watershed based plan identifies and prioritizes several types of bacteria sources for mitigation, including developed area runoff, failing septic systems, and agricultural runoff. This plan also serves as an excellent template for those seeking implementation funding under the federal Section 319 program. The Greenville illicit discharge detection and elimination (IDDE) investigation on the Souhegan River provides a template for conducting investigations to remove bacteria sources from storm drainage systems.

The DES TMDL Program does not have funding for implementation, however, As stated in Section 7 of the report, federal grant money is available to help communities off-set some of the costs associated with identifying and reducing and/or eliminating nonpoint source pollution. For example, DES staff in the Watershed Assistance Program are available to assist communities by providing information and assistance with filing applications for the federal Clean Water Act 319 Grant funds which can be used for qualifying nonpoint source load reductions to impaired waterbodies. For more information about the 319 grant funds visit the Watershed Assistance Program website at:

<http://des.nh.gov/organization/divisions/water/wmb/was/categories/grants.htm>.

B.5 COMMENT:

The document in general seems well prepared but could benefit from further detail explanation and mapping of the watershed characteristics, specifically a breakdown of impervious v. pervious covers, development type and its location in the watershed, hot spot or know pollutant source areas, WWTP outfalls, large residential areas that have individual septic systems, and other detail that would allow the LACs to analyze the data and target their efforts and ideas for restoration plans

B.5 DES RESPONSE: (NO CHANGES MADE)

Please see B.4 DES Response above.

B.6 COMMENT :

The last sentence on page 94 of the statewide-bacteria-draft.pdf the word summary is missing a “y”

DES RESPONSE: (CHANGES MADE)

C. Comments from Tracie Sales, Water Resources Manager, Merrimack River Watershed Council, Inc.

C.1 COMMENT :

TMDL Process Incomplete

MRWC considers this draft to be a good first step toward creating a statewide bacteria TMDL for New Hampshire. However, we feel that the current document contains only part of the information necessary in a complete TMDL. Section 1.1 of the draft lists the necessary components of the TMDL process, yet many of these essential steps have either not been completed at all or are too general to provide meaningful guidance. Specifically:

1. *Identification of the major source of pollutant(s)* – This section appears to have been completed only on a general level. There has been no identification of sources of pollution pertaining to each impaired waterbody. MRWC believes that these sources of bacteria pollution should be specifically recognized for each waterbody listed as impaired, or at minimum for each impaired HUC8 level watershed.
2. *Estimation of existing pollutant loadings from each major source* – This step was not addressed and MRWC feels that this TMDL should include the specific amounts of pollution that the major sources are contributing to each impaired waterbody. Without this information, there is no ability to determine which sources should be the main focus of bacteria loading reductions.
3. *Calculation of the maximum load (i.e. the TMDL) that the surface water can assimilate and still meet water quality standards* – The values listed are the New Hampshire state water quality standards. New Hampshire state regulations already demand that water quality standards must be met; therefore, no new information is being provided in this document, which could at least review the likely sensitivity of each watershed or assessment unit based on factors such as percent impervious cover and presence of sensitive species.
4. *Allocation of the maximum load among point and non-point sources* – This information is not included. Nothing is said about how much bacteria can be input from each of the major sources, other than to say that all inputs must meet water quality standards. MRWC believes that sources must first be allocated a loading in order to measurably reduce inputs, and that this component of the TMDL process is missing.
5. *Calculation of the reduction in pollutant load needed to achieve water quality standards* – Calculations in this section are too general. Calculations were not made by source, but by the whole assessment unit. MRWC thinks the percent reductions should be calculated according to specific bacteria loadings from each of the discharging sources.
6. *Recommendations for implementing the TMDL so that water quality standards will ultimately be achieved* - These have been addressed in Section 6.2 in the form of Best Management Practises (BMPs), but only as a general discussion of potential options. MRWC believes that the BMPs should be explicitly geared

- towards achieving the specific percent reductions for each impaired waterbody, assessment unit, or, at minimum, HUC8 level watershed.
7. *Opportunity for public comment prior to finalizing the TMDL* – Fully completed.
 8. *Submission of the final TMDL by the State to regional EPA office for final approval* –Future completion assumed.

C.1 DES RESPONSE: (NO CHANGES MADE)

In response to Item 1. *Identification of the major source of pollutant(s)*, the goals of this Statewide Bacteria TMDL (as stated in Section 1 of the report) are to:

Provide documentation of impairment;

Determine the TMDLs that will achieve water quality standards;

Calculate the reductions necessary to achieve the TMDLs;

Provide tools to help communities, watershed groups, and other stakeholders to implement the TMDL in a phased approach that will ultimately result in attainment of water quality standards.

Section 3 of the report defines point and nonpoint sources of bacterial pollution and provides examples of bacteria sources that typically affect New Hampshire surface waters. Section 5.2 includes allocations for each major source category and Section 6 includes a menu of mitigation measures (organized by each major source) to reduce bacteria loadings. Consistent with goals of the report mentioned above, these are some of the tools provided to help stakeholders implement the TMDL in a phased approach.

Identification of specific sources and loadings from each source within each impaired assessment unit, was not a goal of this report, nor was it possible to readily determine this information with the data that was readily available for each of the 379 impaired assessment units. However, recognizing that such site specific information can be useful, examples of such studies were included in the TMDL to educate and provide stakeholders with another tool to assist them with restoration efforts (see DES Response B.4 regarding the Furnace Brook Watershed-Based Restoration Plan and Greenville Illicit Discharge Detection and Elimination (IDDE) Investigation).

In addition to the two site specific investigations mentioned above, a wet/dry analysis was conducted (see Section 8.2 of the report) to assign a wet or dry weather status to as many bacteria sampling data points as possible. Knowing whether bacteria violations occur during wet or dry weather conditions can be very helpful in prioritizing bacteria sources in each impaired assessment unit for mitigation.

In response to Item 2, *Estimation of existing pollutant loadings from each major source*, please see our response to Item 1 above.

In response to Item 3, *Calculation of the maximum load (i.e. the TMDL) that the surface water can assimilate and still meet water quality standards* the NH bacteria TMDLs are expressed as both daily loads and as concentrations.(see Section 5 of the report)., Daily load TMDLs are expressed in terms of billions of organisms / day and are included in Appendix P. The concentration-based TMDL endpoints are set equal to NH water quality criteria for bacteria, in terms of count/100mL. DES believes that the most useful way to express bacteria TMDLs is in terms of concentration because:

- The units are consistent with how compliance with ambient water quality criteria are expressed;**
- The units are consistent with how compliance with ambient water quality criteria are determined;**
- Concentration-based TMDLs are simpler and easier for the public to understand;**
- Progress towards compliance is easier to measure and track than a TMDL expressed as load per day, which requires an estimate of flow and/or volume as well as concentration;**

With regards to providing an idea of the sensitivity of each watershed or assessment unit, percent reductions based on ambient concentrations and the pertinent bacteria water quality criterion were provided in Section 8 of the report. The percent reduction estimates provide a rough estimate of the percent reduction needed in each impaired assessment unit to meet standards. Since the reduction estimates are based on ambient concentrations they account for many factors in the watershed that can influence bacteria levels in surface waters (such as the amount of impervious cover which stormwater runoff and pollutant loads, the effectiveness of local pet waste ordinances, the effectiveness of efforts to mitigate CSOs, etc.)

With regards to the impacts of impervious cover on ambient water quality, DES agrees that increasing impervious cover can often lead to a decline in ambient surface water quality. This is because increases in impervious cover can result in increased stormwater runoff volume, peak flows and pollutant loads which can all adversely impact water quality. In recognition of the relationship between impervious cover, stormwater runoff and ambient water quality, DES is developing TMDLs for several stormwater impaired assessment units which will have a TMDL target based on the allowable percent impervious cover in the watershed. That is, impervious cover is being used as a surrogate for the many pollutants in untreated stormwater runoff that can adversely impact receiving surface waters. New Hampshire's impervious cover TMDLs are expected to be available for public comment within the next year. Similar impervious cover TMDLs have been developed by others including the Maine Department of Environmental Protection

(see

http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/barberry_ck_rep.pdf).

In response to Item 4, *Allocation of the maximum load among point and non-point sources*, please see DES' response to Item 3 above regarding the two types of TMDLs provided and why DES believes the concentration-based TMDLs are most useful.

As mentioned in Section 5 of the report, concentration-based bacteria TMDLs set the WLA and LA equal to the ambient water quality criterion with no allowance for dilution or bacteria die-off. Consequently, the New Hampshire bacteria TMDLs represent very conservative TMDL target-setting, so there is a high level of confidence that the TMDLs established are consistent with water quality standards, and the entire loading capacity can be allocated among sources.

These concentration-based bacteria TMDLs allocate the load among sources, identifying waste load allocations (WLA) for point sources, and load allocations (LA) for non-point sources and natural background. The numeric value of the WLA and LA depends on whether the source of bacteria is prohibited or allowable, and the appropriate water quality criterion for the receiving water, as follows:

- **If the source of the bacteria load is prohibited (e.g., discharges of wastewater to Class A waters and discharges of untreated wastewater to any surface water from sources such as illicit discharges to stormwater systems, sanitary sewer overflows, boats, failed septic systems, etc.) , the WLA or LA is set equal to zero.**
- **If the source of the bacteria load is allowable, the WLA or LA is set equal to the applicable water quality criterion for bacteria in the receiving water.**

The underlying assumption in setting a concentration-based TMDL for bacteria is that if all sources are less than or equal to the water quality standard, then the concentration of bacteria within the receiving water will attain water quality standards. This methodology implies a goal of meeting bacteria standards at the point of discharge for all sources. Although it is recognized that end of pipe bacteria measurements can identify and help prioritize sources that require attention, compliance with this TMDL will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). Consequently phased implementation of this TMDL is recommended wherein measures to reduce bacteria levels are implemented followed by ambient monitoring to determine the effectiveness of bacteria reduction efforts. If standards are not met, additional reductions would be necessary.

In response to Item 5, *Calculation of the reduction in pollutant load needed to achieve water quality standard*, please see DES' response to Items 1 and 3 above

In response to Item 6, *Recommendations for implementing the TMDL so that water quality standards will ultimately be achieved*, please see B.4 DES Response above.

In response to Item 7, *Opportunity for public comment prior to finalizing the TMDL*, the public participation process for this TMDL is described in Section 5.6 of the final report.

In response to Item 8, *Submission of the final TMDL by the State to regional EPA office for final approval*, DES intends to submit the final TMDL for EPA approval in September 2010.

C.2 COMMENT:

CSOs Not Fully Addressed

The draft states that CSOs are included as NPDES Non-Stormwater discharges, allowable up to 406 cfu/100mL. However, it is unclear if data being used to calculate pollutant loadings includes water quality data collected during CSO events. CSOs have historically been a problem on the Merrimack River in certain communities, and MRWC would like to see them addressed in more detail.

C.2 DES RESPONSE: (NO CHANGES MADE)

CSOs contain untreated sewage and as such, typically have very high bacteria counts (in the tens of thousands and more) that will likely cause violations of ambient bacteria water quality standards. Sampling of CSOs conducted by NH CSO communities in the 1990's confirmed this.

The table below shows the seven impaired assessment units (AUs) on the Merrimack River that are likely influenced by bacteria from CSO discharges in Manchester and/or Nashua. Bacteria data, percent reductions needed to meet standards based on the highest recorded values, and estimates of whether the data was taken during wet or dry weather (based on the methodology described in Section 8 of the report) are provided in Appendix H.

Assessment Unit	Primary Location	Percent Reduction based on Highest Single Sample
NHIMP700060802-04 (see H30 in Appendix H)	Manchester	83%
NHRIV700060802-14-02 (see H31 in Appendix H)	Hooksett	98%
NHRIV700060803-14-02 (see H33 in Appendix H)	Manchester	94%

Assessment Unit	Primary Location	Percent Reduction based on Highest Single Sample
NHRIV700060804-11 (see H34 in Appendix H)	Merrimack	87%
NHRIV700061002-13 (see H58 in Appendix H)	Merrimack	54%
NHRIV700061002-14 (see H59 in Appendix H)	Nashua	72%
NHRIV700061206-24 (see H77 in Appendix H)	Nashua	96%

As indicated in Appendix H, it was not possible to predict if samples were taken during wet or dry weather for much of the data in these assessment units. However, the relatively high percent reductions based on single sample criterion shown in the table above, especially in Manchester and Nashua where the CSOs discharge, coupled with the knowledge that CSOs typically contain high bacteria concentrations, suggest that at least some of the samples were likely influenced by CSO discharges.

Regardless of the estimated percent reduction shown in this TMDL, bacteria pollution from CSOs is and will continue to be addressed. As discussed in Section 6.2.3 of the report, CSOs are regulated under the federal National Pollutant Discharge Elimination System (NPDES) program which is an enforceable permit administered by the U.S. EPA (with input from DES). As of 1997, all CSO communities are responsible for implementing EPA's 9 minimum technology-based controls (described in section 6.2.3 of the report) and are now implementing and/or updating EPA/DES approved long term CSO control plans with enforceable schedules to abate CSO pollution.

Finally, with regards to end of pipe limits for CSOs, please note that the second item in Table 5-4 of the report states the following: "Although meeting ambient bacteria standards at the point of discharge for all sources is the goal of this TMDL, compliance will be based on ambient water quality and not water quality at the point of discharge (i.e., end of pipe). In addition, per Env-Wq 1703.06(c), for non-tidal CSO discharges in Class B waters, a bacteria criteria of 1000 E. coli / 100 ml shall be applied at the end of pipe".

C.3 COMMENT

Interstate Watersheds Not Considered

The Merrimack River Watershed Council recognizes that this is a statewide TMDL specifically for New Hampshire. However, several rivers in New Hampshire, including the Merrimack River and several of its tributaries, cross state boundaries. MRWC found

it surprising that the issue of interstate rivers was not mentioned at all within the report. When dealing with a TMDL for the Merrimack River, the WLAs and LAs must be split between New Hampshire and Massachusetts. Additionally, New Hampshire and Massachusetts have different standards for safe levels of bacteria, both of which have to be accounted for in a river that affects an interstate river such as the Merrimack. MRWC believes that this report needs to outline the procedure for calculating and implementing a TMDL for interstate watersheds. Collaboration between affected states would lead to more efficient TMDL implementation. MRWC would like to note the following examples:

1. Section 4.2 states that “Section 303(d) of the Clean Water Act requires that waters on the 303(d) list be ranked in order of TMDL development priority. [...] A preliminary rank of high, medium, or low is first established based on whether the waterbody poses a threat to human health or to federally listed threatened or endangered species. The final TMDL priority ranking is then determined by considering other institutional and technical factors, such as public interest, funding, and potential legal factors that can influence the priorities of TMDLs (NHDES, 2008a)”. There should be a comment on how a TMDL priority ranking would be developed for an interstate watershed, where the public interest, funding, and potential legal factors may differ between states.
2. Section 6.2 explains “A watershed management plan should address a watershed area large enough to ensure that implementing the plan will address all the major sources and causes of impairments and threats to the waterbody of interest. [...] It is possible for multiple impaired segments within a New Hampshire HUC 8 watershed to be addressed in the same watershed management plan.” Again there is no mention of interstate watersheds, and how those should be included in the same watershed management plan.
3. Although New Hampshire state water quality standards are stricter for designated beaches in Class B waters than Massachusetts standards (88 cfu/100mL versus 235 cfu/100mL), general water quality standards are stricter for Class B waters in Massachusetts (235 cfu/100mL versus 406 cfu/100mL). The same scenario can be applied to Vermont and New Hampshire standards for the Connecticut River. Vermont’s water quality standards for all Class B waters is 77 cfu/100mL, which is more stringent than New Hampshire’s 406 cfu/100mL, and even the 88 cfu/100mL at designated beaches. In this case, water quality could be considered healthy in one state, while it fails to meet standards as soon as the state boarder is crossed. MRWC would like to suggest that when creating a TMDL for an interstate watershed, states must adhere to the more stringent of the differing state standards.

C.3 DES RESPONSE: (NO CHANGES MADE)

TMDLs in New Hampshire are written to comply with New Hampshire water quality standards. According to federal regulation [40 CFR 130.7(d)] TMDLs must be approved by the EPA. However, before the EPA will approve a TMDL, they must be satisfied that it meets standards in downstream states. EPA has reviewed

the draft TMDL and believes that it will not cause violations of bacteria standards in downstream states (Massachusetts and Maine). The reason for this, and as stated in Section 5.2 of the report, is that concentration based TMDLs are conservatively based on sources meeting ambient bacteria concentration standards (or less) with no allowance for dilution or bacteria die-off. Consequently, although downstream states like Massachusetts may have a slightly lower bacteria standard, the conservatism built into concentration based TMDLs is expected to be sufficient to overcome the difference and result in compliance at the border with downstream state standards. This coupled with the fact that Maine recently completed a concentration based bacteria TMDL (see <http://www.maine.gov/dep/blwq/docmonitoring/TMDL/2009/report.pdf>) and Massachusetts is in the process of completing a similar statewide concentration based bacteria TMDL, adds an additional level of conservatism and confidence that New Hampshire's statewide bacteria TMDL will comply with downstream state standards at the border. Finally, it should be noted that although Massachusetts's single sample criterion are less, their Class B geometric mean criterion for E. coli (126 cts/100mL) is the same as New Hampshire's Class B geometric mean criterion for fresh surface waters that are not designated beaches.

D. Comments from Kathryn Nelson, Water Monitoring Coordinator, Nashua River Watershed Association

D.1 COMMENT:

Timeframe for reductions

The NRWA agrees that elimination of illicit sewer sources, CSO abatement, and repair of failing infrastructure are key to the reduction of pathogen impairment in the urban areas and that greater than 90% reduction in storm water fecal coliform loadings (from all sources) will be necessary. The financial burden to the city of Nashua by required infrastructure improvements is enormous. However we support a stringent but realistic timeframe to achieve the necessary reductions. Wording that encourages the most expedient remediation in this effort, including funding, is encouraged.

D.1 DES RESPONSE: (CHANGES MADE)

The TMDL program does not have the regulatory authority to specify time frames for implementation of TMDLs. However, DES would certainly prefer and encourage implementation efforts to be expedited wherever practicable to restore impaired surface waters as quickly as possible. To promote this goal, the following sentence has been added at the end of the first paragraph in Section 6 of the report: "To restore impaired water bodies as quickly as possible, it is recommended that TMDL implementation efforts, including the securement of funding, be expedited to the maximum extent practicable and in accordance with all laws and regulations."

The sources mentioned above [illicit sewer sources, CSOs and failing infrastructure (assumed to be wastewater collection systems)] are all regulated (and enforced)

under the federal National Pollutant Discharge Elimination System (NPDES) permit program. It should be noted that NPDES permits for publicly owned treatment works are being reissued for the first time with collection system operation and maintenance requirements. These requirements also apply to the owners of collection systems in abutting municipalities that send their sewage to the WWTF. NPDES permits include enforceable limits and conditions that are designed to comply with state surface water quality standards. When permit violations occur, EPA and/or DES take action to correct the violations.

It is realized that the financial burden on cities such as Nashua to abate pollution from these sources can be significant. To assist communities, the State offers grants and low interest loans for eligible projects (see <http://des.nh.gov/organization/divisions/water/www/grants.htm> and low interest loans.

D.2 COMMENT:

Data

The NRWA is pleased to be included in the effort to reduce pathogen loading to the watershed. We have been submitting our E.coli data to DES and it has been included in the annual VRAP Reports. We have an EPA and NHDES approved QAPP. The data used in the draft TMDL does not appear to include any of the data we have submitted. The NRWA's Water Quality Monitoring Report includes more "wet weather" data than are included in the Draft TMDL. We feel these data are more representative of the variations and exceedences in bacteria concentrations due to wet weather. The NRWA data is also more up to date and also includes sites not monitored by DES.

D.2 DES RESPONSE: (NO CHANGES MADE)

DES acknowledges, and apologizes, for inadvertently not adding a portion of the data collected by the NRWA to the DES Environmental Monitoring Database ("EMD") and including it in the most recent assessment. DES will add the remaining data into the EMD so it can be included in the next round of water quality assessments which are due in the spring of 2012.

D.3 COMMENT:

% Reduction Allocation

It is our understanding that that each assessment unit was monitored over a period of time to establish a geometric mean and maximum grab sample concentration. This value was compared to the TMDL to determine the % reduction required. The TMDL identifies several sources of the bacteria impairment but does not cull out a percent contribution for CSOs or other sources. In an urban area such as Nashua where the river is highly influenced by CSO events the amount allocated to CSO's is important information as a starting point for an Implementation Plan. Watershed groups do not have access to discharge data from the Nashua Wastewater Treatment Facility. For an implementation plan, data is needed to identify a % reduction allocation for NPS specific to the Nashua River.

D.3 DES RESPONSE: (NO CHANGES MADE)

First, as a point of clarification, not all assessment units listed as impaired had sufficient data to calculate a geometric mean (see A.2 DES Response above for more information on bacteria water quality standards and how they were used to make assessments).

With regards to source loads and reductions, please see C.1 DES Response (Item 1 and Item 3). With regards to implementation plans, please see B.4 DES Response above.

With regards to allocations for CSOs and wastewater treatment facilities (WWTFs), State regulations specify end of pipe limits. For CSOs, Table 5.4 in the report states “per Env-Wq 1703.06(c), for non-tidal CSO discharges in Class B waters, a bacteria criteria of 1000 E. coli / 100 ml shall be applied at the end of pipe.” With regards to allocations for WWTFs, Section 2.2.2 of the report states that “...New Hampshire surface water quality regulations [Env-Wq 1703.06 (b)] also specify that bacteria criteria must be met at the end of discharge pipe(s) from wastewater treatment facilities.” These end of pipe bacteria criteria are included in the Nashua WWTF’s federal National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits include enforceable limits and conditions that are designed to comply with state surface water quality standards. When permit violations occur, EPA and/or DES take action to correct the violations.

D.4 COMMENT :

Designated Beach standard.

To achieve the goal of having the Nashua River be swimmable, the assigned TMDL value should be lower and meet the class B designated beach standard. The Nashua River will truly be a driver of economic development and a community asset when it provides consistent and reliable recreation for boating, swimming and fishing. The TMDL should reflect this goal.

D.4 DES RESPONSE: (NO CHANGES MADE)

Please see B.1 DES Response above.

D.5 COMMENT:

On-site Treatment Systems

Many beach closings in the summer occur during periods of low stream flow that result in corresponding increases in bacteria concentrations. Maximizing base flow is one way to decrease pathogen concentrations during periods of drought or low precipitation. The NRWA would like to see strong recommendations to promote improvements in septic systems rather than sewerage if possible, to keep water “local”. Communities must weigh the environmental benefits” of septic vs. sewerage due to the increased potential for

development in sewerred areas. We would like this language included in the Nashua TMDL.

D.5 DES RESPONSE: (CHANGES MADE)

DES agrees that maintenance of baseflow in rivers and streams is important for many reasons. To acknowledge this the second sentence of the second paragraph in Section 6.2.4 Septic Systems was revised to read as follows: “When properly installed, operated, and maintained, septic systems effectively reduce pathogen concentrations in sewage and help to maintain base flows in rivers and stream by replenishing the groundwater (versus sewerred which can result in reductions in local base flow.”).

D.6 COMMENT:

Implementation Plan

The NRWA is committed to efforts to control pathogen concentrations in the Nashua River Watershed. Among other efforts, we conduct ongoing outreach, education and monitoring programs. Last year we held a workshop on proper care and maintenance of septic systems. We publish the results of our monthly E.coli monitoring in local papers with tips on how to reduce runoff into waterways. We provide workshops on LID to both the development community and the public. However, funding the staff time to carry out these tasks is an ongoing issue. NRWA involvement in implementation plans and tasks will be limited without sufficient funding. We would like to work with you to see how NRWA participation can be maximized.

D.6 DES RESPONSE: (NO CHANGES MADE)

DES would be pleased to work with the NRWA to see how NRWA participation can be maximized and encourages the NRWA to contact the DES Watershed Assistance Section located in the DES Watershed Management Bureau for information on Section 319 funding opportunities.

E. Comments received on 8/16/2010 from Baraba Skuly of the Ashuelot River LAC

E.1 COMMENT:

I apologize for the lateness of my observations but am just getting to look at this and hope this discrepancy can be rectified if necessary.

Two sites noted on the Ashuelot River are 15-ASH and 23-ASH. The descriptors are "15-ASH New Bridge (Thompson) in W. Swanzey, " and "23-ASH Bridge on Rte 10, in lower village." I am sure the data here is from ARLAC's sampling. Sampling reported as 15-ASH has always been collected above the Thompson Covered Bridge which is upstream of the New Bridge; a distance of perhaps 2,000 ft.

Sampling reported as 23-ASH has always been collected at a pull-off downstream of the Rte 10 Bridge in lower village, perhaps a distance just under 1,000 ft.

I don't know if this makes any difference in the reporting, but I think it should be corrected.

E.1 DES RESPONSE: (CHANGES MADE)

DES changed the narrative descriptions of the two sampling sites in Appendix N to 2,000 ft upstream for 15-ASH and 1,000 ft downstream for 23-ASH.